



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/889,625	07/19/2001	Kiyoshi Iwanaga	Q65479	6942

7590 06/17/2004

Sughrue Mion Zinn Macpeak & Seas
2100 Pennsylvania Avenue NW
Washington, DC 20037-3202

EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
----------	--------------

1754

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/889,625

Applicant(s)

IWANAGA ET AL.

Examiner

Ngoc-Yen M. Nguyen

Art Unit

1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

There is no antecedent basis for "the tubular reactor" in claim 1.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP '803 in view of either Kulhmann et al (4,299,977) or Fornoni (4,188,184).

EP '803 discloses a process for producing chlorine from hydrogen chloride in a sequence of steps using a combination of fixed bed catalytic reactors operating in two distinct temperature ranges. As shown in the Figure 1, a group of four reactors arranged to permit each of the four principal steps of the process to be carried out simultaneously. Accordingly, reactors 10, 11, 12, and 13 each contain a fixed bed of Deacon reaction catalyst. Also, each of these reactors have indirect heat exchange

Art Unit: 1754

means such as heating or cooling coils 14 and 16 associated with reactors 11 and 13, respectively. The corresponding coils for reactors 10 and 12 are not shown (note page 5, lines 44-46). The reactors 11-13 are clearly shown in Figure 1 as being connected in series.

The catalyst material in EP '803 can be any catalyst operative in the Deacon process. In general, such catalysts are well known and are described in the technical literature and issued patents. Often alkali metal chlorides, such as sodium or potassium chloride, are included, as are salts of rare earth metals. Suitable supports include well known carriers such as alumina, silica, silica-alumina and various known zeolite molecular sieves. These supports are considered inert, but this does not preclude the support material from having an enhancing effect upon the activity of the catalytic compounds (note page 5, lines 22-32). When more than one compound are used as the catalysts or when the support has enhancing effect, the catalysts in EP '803 are considered as having "at least two kinds".

EP '803 discloses that the process has four steps:

In step (a): an HCl-containing stream is directed into a defined volume in contact with a fixed bed of Deacon reaction catalyst containing supported metal oxide species. The temperature of step (a) is in the range of 180 to 290°C, and the reaction proceeds to convert at least a portion of said metal oxide to metal chloride species, forming water in the process.

In step (b): the HCl-containing stream is redirected to another catalytic fixed bed volume for repetition of step (a) while heating the first bed of catalyst having just

Art Unit: 1754

completed step (a) to a temperature in the range of 300 to 400°C for performance of step (c) which, under certain conditions, can be combined with step (b).

In step (c): the heated catalyst of step (b) is contacted with an oxygen-containing stream at a temperature in the range of 300-400°C, to form metal oxide species in the heated catalyst suitable for use in a repetition of step (a). This reaction produces chlorine and chlorine-containing gas is withdrawn in an effluent stream.

In the final step (d): the oxygen-containing stream of step (c) is redirected to another volume for repetition of step (c) and the bed of catalyst having just completed step (c) is cooled to a temperature in the range of 180 to 290°C, thereby separating the catalyst bed for repeating step (a) (note page 3, lines 12-34).

EP '803 further discloses that by using fixed bed catalysts instead of fluidized beds, the disadvantages of the fluidized beds are overcome while retaining the advantages and flexibility of carrying out the reaction in two process steps under the optimum conditions for each step. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to optimize the volume% of the first catalyst bed, the thermal conductivity, the activities in the reaction zones of the process of EP '803 in order to maintain the desired temperatures and to obtain the best results.

The difference is EP '803 does not disclose the use of jacket, outside of the reactor as the indirect means for heating and/or cooling the reactor.

Kuhlmann '977 that suitable indirect heat exchange means, which are known in the art, include a cooling jacket, an internal cooling coil, internal cooling tubes or an

Art Unit: 1754

external heat exchanger such as a tube and shell heat exchanger (note column 5, lines 28-34).

Alternatively, Fornoni teaches that well known systems of indirect heating are heating coils, double jackets etc., in contact with the treated substances (note column 4, lines 28-33).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made to use a jacket outside of the reactor as indirect heating means for the process of EP '803 instead of the heating/cooling coils because these means are art recognized equivalents as shown by Kuhlmann '977 or Fornoni.

Applicant's arguments filed March 11, 2004 have been fully considered but they are not persuasive.

The 102 rejection is withdrawn in view of Applicants' amendment to claim 1.

Applicants argue that the underlying chemical reactions of the claimed process and the process of EP '803 are different.

It should be noted that the "comprising" language of Applicants' claims does not exclude any extra step or reaction disclosed in the EP '803. Applicants' claims are broad enough to include any process which includes 2 reactions as long as the overall reaction of "oxidizing hydrogen chloride" would occur.

Applicants argue that Applicants' claims now require a jacket outside the tubular reactor to remove the heat generated by the reaction.

Art Unit: 1754

In EP '803, "indirect heat exchange means" are disclosed to heat or cool the reactor. The heating or cooling coils are exemplified, however, the disclosure of EP '803 should not be limited to just the exemplified means. It would have been obvious to one of ordinary skill in the art to use any known, conventional indirect heating means in the art, such as a jacket, as shown by Kuhlmann '977 or Fornoni '184 in the process of EP '803 for heating or cooling the reactor.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

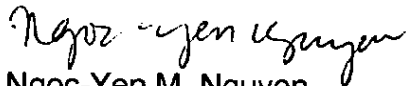
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 1754

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
June 14, 2004